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10/064,283	06/28/2002	Norman Arnold Turnquist	121251	4427

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GENERAL ELECTRIC COMPANY
GLOBAL RESEARCH
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EXAMINER	
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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Paper No. 10

Application Number: 10/064,283
Filing Date: June 28, 2002
Appellant(s): TURNQUIST ET AL.

Ann M Agosti
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 2/2/04.

(1) Real Party in Interest

A statement identifying the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

A statement identifying the related appeals and interferences which will directly affect or be directly affected by or have a bearing on the decision in the pending appeal is contained in the brief.

(3) Status of Claims

The statement of the status of the claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellants' statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Invention

The summary of invention contained in the brief is correct.

(6) Issues

The appellants' statement of the issues in the brief is correct.

(7) Grouping of Claims

Appellants' brief includes a statement that claims 1-18 do not stand or fall together and provides reasons as set forth in 37 CFR 1.192(c)(7) and (c)(8).

(8) Claims Appealed

The copy of the appealed claims contained in the Appendix to the brief is correct.

(9) Prior Art of Record

5252224 Modell et al 10/12/1993

Product Brochure of Hastelloy C-276, Page 1

(10) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

1. Claims 1-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Basu et al (US. 5,884,918).

Basu et al discloses a turbine having a brush seal, an energy source of the steam turbine is selected from the group consisting essentially of nuclear plants, fossil-fuel plants and combined cycle plants (inherent uses of a turbine source), the brush seal is used to reduce leakage of a working fluid, the brush seal comprising:

a bristle holder (72 and 74) attachable to the steam turbine;

a plurality of bristles coupled to the bristle holder, the plurality of bristles comprising Ni, Cr and etc (bristles formed of nickel alloy, Haynes 25 or Haynes 214);

the operating temperature of the section is in the range between about 100 degrees and about 500 degrees F (intended use environment, well know in the art that turbine operate at this temperature range, see appellants' specification paragraph 0003);

the operating pressure of the section is up to about 160psia (intended use environment, well known in the art that the turbine operate at high pressure, see appellants' specification paragraph 0003);

a stator disposed in the steam turbine (turbine housing is the stator);

a rotor (28) spaced apart from the stator so as to define a gap therebetween; and

a brush seal disposed in a section of the steam turbine.

Basu discloses the claimed invention except for that the bristles are made of about 16% Cr, about 16% Mo, about 5% Fe, about 4% W, less than about 2.5% Co, about 1% Mn, about 0.35% V, about 0.08% Si, about 0.01 % C, and remainder of Ni (meaning the bristle are formed from Hastelloy manufactured by Haynes). It would have been obvious to one having ordinary skill in the art at the time the invention was made to have the bristle be made of Hastelloy C-276), since it has been held to be within the general skill of a worker in the art to select a know material on the basis of its suitability for the intended use as a matter of obvious design choice. In re Leshin, 125 USPQ 416. Furthermore, evidence shown provided that the material selection is a matter of design choice based upon recognized art equivalent material as shown in Modell. The bristles are formed from material such as a nickel alloy or Hastelloy C-276 (material of appellants') thus it is recognized that these materials are readily substitutable.

2. Claims 1-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Basu in view of Modell et al (US. 5,252,224).

Basu disclose the invention substantially as claimed above but fails to disclose that the bristles are made of about 16% Cr, about 16% Mo, about 5% Fe, about 4% W, less than about 2.5% Co, about 1% Mn, about 0.35% V, about 0.08% Si, about 0.01 % C, and remainder of Ni (meaning the bristle are formed from Hastelloy manufactured by Haynes). Modell discloses a brush seal having bristle (brush 122 having bristles) and the bristle are made of Inconel 625 (nickel alloy) or Hastelloy C-276 or stainless steel (column 14, lines 40-45). It would have been obvious to one having ordinary skill in the art at the time the invention was made to configure the bristle of Basu to have that the bristles are made of about 16% Cr, about 16% Mo, about 5% Fe, about 4% W, less than about 2.5% Co, about 1% Mn, about 0.35% V, about 0.08% Si, about

0.01 % C, and remainder of Ni (meaning the bristle are formed from Hastelloy manufactured by Haynes) as taught by Modell, since having one nickel or another nickel alloy for bristle is considered to be art equivalent and providing bristle that have better integrity (column 14, line 47 of Modell).

(11) Response to Argument

For the above reasons, it is believed that the rejections should be sustained.

Finding of Facts Table:

Finding of Facts Table:

Appellants' Invention	***Disclosed by the References***
1. A brush seal, disposed in a section of a steam turbine, for reducing leakage of a working fluid across a pressure drop, the brush seal comprising: a bristle holder attachable to the steam turbine, a plurality of bristles coupled to the bristle holder. The operating temperature of the section is in the range between about 100 to 500 degrees F and about 160psia. The steam turbine comprises a stator and rotor. A method of retrofitting a steam turbine, providing a stator and rotor, providing a brush seal and the brush seal being disposable in a section of the turbine.	1. Basu discloses a brush seal (62), disposed in a section of a steam turbine, for reducing leakage of a working fluid across a pressure drop (this is the case since a high pressure exist on one side of the brush seal and a low pressure exist on other side of the brush seal), the brush seal comprising: a bristle holder (holder formed by 72 and 74) attachable to the steam turbine (intended use, the bristle holder is attachable to a steam turbine, column 1, lines 5-50), a plurality of bristles (bristles 64) coupled to the bristle holder (the bristles are coupled to the bristle holder) and the bristles

	comprise Ni, Cr and etc (bristles formed of nickel alloy or Hayes 25 or Hayes 214). The operating temperature of the section is in the range of 100 to 500 degrees F and about 160psia (intended use, see appellants' specification, paragraph 0003 and this is inherent in a turbine, since turbine operate at different temperatures and pressures). The turbine comprises a stator (the turbine housing being the stator) and a rotor (the shaft 28 is the rotor). The method is inherent in view of the limitations above (Basu discloses a stator, rotor of a turbine, a brush seal disposed in a section of the turbine, the brush seal having a bristle holder and bristle).
2. The bristle comprise Ni, Cr, Mo, Fe, W, Mn, V, Si and C. The material of bristles having less than 2.5% cobalt by weight. The bristle comprises about 16% Cr, about 16% Mo, about 5% Fe, about 1% Mn, about 0.35% V, about 0.08% Si, about 0.01% C and a remainder of Ni (this is the case when Hastelloy C-276 is	2. Basu disclose the invention substantially as claimed above but fail to disclose that the bristle comprise Ni, Cr, Mo, Fe, W, Mn, V, Si and C, the material of bristles having less than 2.5% cobalt by weight, the bristle comprises about 16% Cr, about 16% Mo, about 5% Fe, about 1% Mn, about 0.35% V, about 0.08% Si,

used as bristle material).	about 0.01% C and a remainder of Ni (this is the case when hastelloy C-276 is used as bristle material). It would have been obvious to one having ordinary skill in the art at the time the invention was made to have the bristle be made of Hastelloy C-276, since it has been held to be within the general skill of a worker in the art to select a know material on the basis of its suitability for the intended use as a matter of obvious design choice. In re Leshin, 125 USPQ 416. Furthermore evidence is shown of art equivalent material by Modell, that form bristles from material such as a nickel alloy or Hastelloy C-276 (material of appellant or material having 16% Cr, 16% Mo, 5%Fe, 4%W, 2.5%Co, 1%Mn, 0.35%V, 0.08%Si and 0.01%C and remainder Ni).
3. The bristle comprise Ni, Cr, Mo, Fe, W, Mn, V, Si and C. The material of bristles having less than 2.5% cobalt by weight. The bristle comprises about 16% Cr, about 16% Mo, about 5% Fe, about 1% Mn, about 0.35% V, about	3. Basu disclose the invention substantially as claimed above but fail to disclose that the bristles are made of about 16% Cr, about 16% Mo, about 5% Fe, about 4% W, less than about 2.5% Co, about 1% Mn, about 0.35% V, about

0.08% Si, about 0.01% C and a remainder of Ni (this is the case when hastelloy C-276 is used as bristle material).	0.08% Si, about 0.01 % C, and remainder of Ni (meaning the bristle are formed from Hastelloy manufactured by Haynes). Modell et al discloses a brush seal having bristle (brush 122 having bristles, this is considered as a seal because the brush is sent done a tube, pressure is applied to the back of the brush and the brush scrapes the tube in low friction, column 12, line 39-column 13, line 14) and the bristle are made of Inconel 625 (nickel alloy) or Hastelloy C-276 or stainless steel (column 14, lines 40-45). It would have been obvious to one having ordinary skill in the art at the time the invention was made to configure the bristle of Basu to have that the bristles are made of about 16% Cr, about 16% Mo, about 5% Fe, about 4% W, less than about 2.5% Co, about 1% Mn, about 0.35% V, about 0.08% Si, about 0.01 % C, and remainder of Ni (meaning the bristle are formed from Hastelloy manufactured by Haynes) as taught by Modell, since having one nickel or another nickel alloy

	for bristle is considered to be art equivalent and providing bristle that have better integrity (column 14, line 47 of Modell).

Response to Arguments

Appellants' argument against Basu is not persuasive since it is well know in the art to choose bristle material as a matter of choice in design as evidence showed by Modell. Modell's bristles are made from Nickel alloy or Hastelloy C-276 (column 14, lines 41-43 of Modell), which are considered to be art equivalent.

Appellants' argument against the rejection made of Basu in view of Modell is not persuasive since Basu discloses every limitation of the claimed invention except for the material of the bristles. Modell is only used to teach that bristles of a brush seal can be made of Hastelloy C-276, stainless steel or Inconel 625. Furthermore, Modell teaches that bristles made form the above material are considered to be art equivalent bristle materials.

Modell is considered to disclose that the materials Hastelloy and nickel alloy, such as Inconel or stainless steel, are art equivalent for bristle materials. Furthermore, Modell's brush operates as a seal, see column 13, lines 1-23. Modell's brush is pushed along the interior of the piping by fluid pressure acting upon the brush. This action would only occur if the bristles prevent fluid from flowing around the brush.

Appellant appears to be arguing that Modell is non-analogous art. The test for analogous art is a two-part test. The first part is whether the two inventions are in the same field of endeavor. If not, the second part of the test applies which is would a person of ordinary skill in

the art be reasonably lead to modifying reference to solve a problem. It is the examiner's intention that Modell is in the same field of endeavor as applicants, brush seals, as evidenced by the operation of Modell's device. However, if it is determined that Modell is not within the same field of endeavor then one of ordinary skill in the art would reasonably be lead to Modell since minimizing friction between the brush seal and the piping is a problem being solved by Modell, this is the same problem being solved by appellants. Furthermore, one of ordinary skill in the art would reasonably look at how others had made brushes in general to solve this problem.

For the reasons stated above it is submitted that the rejections should be sustained.

Respectfully submitted,

Anthony Knight
Supervisory Patent Examiner
Group 3600

VP
March 30, 2004

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